

**IN THE CLAIMS:**

1           1.       A programmable driver/equalizer for overcoming InterSymbol Interference (ISI)  
2       and other transmission impairments in a variety of transmission media, comprising:

3           (a)     a controllable driver set coupled to a transmission media;

4           (b)     a transversal filter receiving a data input signal and coupled to the transmission  
5       media, the filter having programmable filter coefficients; and

6           (c)     means for altering the frequency response of the controllable driver set to match  
7       the inverse of the frequency response of the transmission media.

1           2.       The programmable driver/ equalizer of Claim 1 further comprising:

2           (d)     means providing constant output peak amplitude on the transmission  
3       media independent of the programmable filter coefficients.

1           3.       The programmable driver/equalizer of Claim 1 further comprising:

2           (e)     logic means for switching the transversal filter and controllable drivers off  
3       high capacitance nodes when the programmable filter coefficients are inactive.

1           4.       The programmable driver/equalizer of Claim 1 further comprising:

2           (f)     means for reducing the (ISI) of the controllable driver set when the  
3       programmable filter coefficient are active.

1            5.        The programmable driver/equalizer of Claim 1 further comprising:  
2                    (g)       means responsive to the programmable filter coefficients providing control  
3 signals for matching the controllable driver set output to the inverse of the transmission media.

1            6.        The programmable driver/equalizer of Claim 1 further comprising:  
2                    (h)       means for storing a present data input signal bit and a history of at least  
3 two past data signal input bits in the transversal filter.

1            7.        The programmable driver/equalizer of Claim 1 further comprising:  
2                    (i)       shift register elements in the transversal filter providing time delays in  
3 processing the data input signal.

1            8.        The programmable driver/equalizer of Claim 1 further comprising:  
2                    (j)       buffer and latch means in the transversal filter for storing data input  
3 signals in time sequence.

1            9.        The programmable driver/equalizer of Claim 1 wherein the transversal filter is  
2 described by  $H(Z) = Ab_0 + Ab_1Z^{-1} + Ab_2Z^{-2} + \dots + Ab_nZ^{-n}$  where numerical value of the  
3 coefficients are set by register values in A and B coefficient setting circuits connected to the  
4 transmission line.

1            10.       The programmable driver/equalizer of Claim 1 wherein the transversal filter is a  
2 finite infinite response (FIR) filter.

1           11.    The programmable driver/equalizer of Claim 1 wherein the controllable driver set  
2 comprises weighted current drivers.

1           12.    The programmable driver/equalizer of Claim 1 wherein the transversal filter  
2 controls the activation of the controllable driver set.

1           13.    The programmable driver/equalizer of Claim 1 wherein the programmable filter  
2 coefficients are set based on the characteristics of the transmission media, speed of transmission,  
3 and characteristics of a receiving unit.

1           14.    The programmable driver/equalizer of Claim 1 wherein the coefficients of the  
2 filter are altered in small increments and matched to each other.

1           15.    The programmable driver/equalizer of Claim 1 wherein the driver out peak  
2 amplifier is constant, independent of programmable coefficient selection.

1           16.    A method for overcoming InterSymbol Interference (ISI) and other various  
2 transmission impairments in a variety of transmission media, comprising the steps of:

3                   (a)    connecting the controllable driver set to an input node and to a transversal  
4 filter including programmable coefficients;

5                   (b)    biasing the controllable driver set for constant output peak amplitude,  
6 regardless of coefficient settings; and

7 (c) altering the coefficients of the transversal filter to vary the driver set  
8 output to provide a frequency response which is the inverse of the transmission medium.

1 17. The method of Claim 16 further comprising the steps of:

2 (d) storing digital input pulses in the transversal filter as time delay units.

1 18. The method of Claim 16 further comprising the steps of:

2 (e) enabling power settings of the controllable driver set to be used for all  
3 possible coefficient possibilities.

1 19. The method of Claim 16 further comprising the step of:

2 (f) reducing self-induced intersymbol interference from the drivers by the  
3 drive strength of the output stage.

1 20. The method of Claim 16 further comprising the steps of:

2 (g) switching off paths to high capacitance nodes in the driver circuit when  
3 the coefficients are inactive to minimize ISI.

1 21. The method of Claim 16 further comprising the steps of:

2 (h) selecting a combination of control bits for the coefficient setting means to  
3 select the appropriate frequency response for the driver according to the various transmission  
4 medium conditions.

1           22.     The method of Claim 16 wherein the controllable driver set is plural current mode  
2 differential drive circuits.

1           23.     A program medium, executable in a computer system, for overcoming  
2 InterSymbol Interference (ISI) and other transmission impairments in a variety of transmission  
3 media, the medium comprising:

4                   (a)     program instructions in the medium for connecting the controllable  
5 driver set to an input node and to a transversal filter including programmable coefficients;

6                   (b)     program instructions in the medium for biasing the controllable driver set  
7 for constant output peak amplitude, regardless of coefficient settings; and

8                   (c)     program instructions in the medium for altering the coefficients of the  
9 transversal filter to vary the driver set output to provide a frequency response which is the  
10 inverse of the transmission medium.

1           24.     The program medium of Claim 23 further comprising:

2                   (d)     program instructions in the medium for storing digital input pulses in the  
3 transversal filter as time delay units.

1           25.     The program medium of Claim 23 further comprising:

2                   (e)     program instructions in the medium for enabling power settings of the  
3 controllable driver set to be used for all possible coefficient possibilities.

1           26.    The program medium of Claim 23 further comprising:

2                   (f)    program instructions in the medium for reducing self-induced intersymbol  
3 interference from the drivers by the drive strength of an output stage.

1           27.    The program medium of Claim 23 further comprising:

2                   (g)    program instructions in the medium for switching off paths to high  
3 capacitance nodes in the driver circuit when the coefficients are inactive to minimize ISI.

1           28.    The program medium Claim 23 further comprising:

2                   (h)    program instructions in the medium for selecting a combination of control  
3 bits for the coefficient setting means to select the appropriate frequency response for the driver  
4 according to the various transmission medium conditions.

1           29    The programming medium of Claim 23 further comprising:

2                   (i)    program instructions in the medium for biasing the controllable driver set  
3 for constant output peak amplitude, regardless of coefficient settings; and

4                   (j)    program instructions in the medium for altering the coefficients of the  
5 transversal filter to vary the driver set output to provide a frequency response which is the  
6 inverse of the transmission medium.

1           30.    The programming medium of Claim 23 further comprising:

2                   (k)    program instructions in the medium for storing digital input pulses in the  
3 transversal filter as time delay units.

4            31.    The programming medium of Claim 23 further comprising:

5 (l) program instructions in the medium for enabling power settings of the  
6 controllable driver set to be used for all possible coefficient possibilities.

1            32.    The program medium of Claim 23 further comprising:

(m) program instructions in the medium for reducing self-induced intersymbol interference from the drivers by the drive strength of the output stage.

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